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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,624	01/28/2002	Christopher Joseph Mussack	15-GS-5902	2402

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EXAMINER

LAO, SUE X

ART UNIT	PAPER NUMBER
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2126

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/683,624

Applicant(s)

MUSSACK ET AL.

Examiner

S. Lao

Art Unit

2126

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-20 are presented for examination.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2, 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites "said data implementation layer" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. For the purpose of art rejection, it is interpreted as "said implementation of said data management layer", as best understood and as it appears to be.

Claim 14 recites "said request" in lines 3. There is insufficient antecedent basis for this limitation in the claim.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

Art Unit: 2126

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 12 is rejected under 35 U.S.C. 102(b) as being anticipated by Mason et al (U S Pat. 5,668,998).

As to claim 12, Mason teaches a method for writing (API toolkit framework) a DICOM application (application conforming to DICOM standard), comprising the step of writing code for a business layer (service class user SCU) of a tiered application (application conforming to DICOM standard, five layers), said code sending synchronous messages that conform to a pre-existing application programming interface (file service using a single, event driven synchronous + asynchronous application programming interface) when DICOM service (msgrequest) is requested by a user (user). See col. 3, line 67 – col. 4, line 16; col. 13, lines 28-47.

7. Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by author admitted prior art (hereafter APA) ([0002]-[0016]) including Mason et al (U S Pat. 5,668,998).

As to claim 13, APA teaches a workstation (PACS) for viewing DICOM images, comprising a computer (MAC CPU), a display monitor (display) and an operator interface (GUI) (U S Pat. 5,668,998, col. 6, line 59 – col. 7, line 13). APA further teaches a tiered application (APA, tiered application, [0006]), comprising an object-oriented implementation (APIs implemented as OO framework, U S Pat. 5,668,998, col. 3, lines 56-65) of a data management layer (APA, data management tier, [0006]) that handles DICOM callbacks (APA, callback, [0015]) in response to requests for DICOM service (APA, DICOM service, [0015]) having a format required by an application programming interface (APA, API, [0014]).

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-7, 14, 19, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over author admitted prior art (hereafter APA) ([0002]-[0016]) including Mason et al (U S Pat. 5,668,998) in view of Shari (U S pat. 6.068,661).

As to claim 19, APA teaches a computer system comprising a database containing DICOM data (provide DICOM service from a database, [0011]) and a tiered application (tiered application, [0006]), wherein said tiered application comprises:

a first tier (business tier, service class user SCU, [0006]) comprising code for requesting a DICOM service by sending a message (command) in a format conforming to an application programming interface (API toolkit, U S Pat. 5,668,998, col. 3, line 56 – col. 4, line 16; col. 13, lines 28-47); and

a second tier (data management tier, service class provider SCP) comprising code for managing said database to provide DICOM service in response to receipt of said request ([0006]),

wherein said code for managing said database sends asynchronous messages (asynchronous message) that implement a DICOM callback mechanism (callback mechanism, [0015]),

wherein said application programming interface represents a seam (unique relationship) between said first tier code and said second tier code (unique relationship between CSU/SCP pair, [0014]).

While APA teaches modifications to the tiered application (APA, [0005]; U S Pat. 5,668,998, col. 3, lines 61-65), APA does not teach the modifications include such that the message sent by the first tier is a synchronous message.

Shari teaches modification (emulation) to a tiered application (fig. 4), including configuring an asynchronous system to emulate a synchronous communication, wherein a first tier (application module) sends a synchronous message (synchronous message 432) conforming to the corresponding API (synchronous interface) which

simulate a synchronous communication while performing an asynchronous transaction. See col. 6, lines 50-54; col. 9, line 11 – col. 11, line 30; fig. 4. Therefore, it would have been obvious to include a synchronous communication and the emulation thereof into the first tier of APA. One of ordinary skill in the art would have been motivated to perform such a modification because this would have reduced the complexity, and thus the cost, associated with developing applications having asynchronous communications (col. 2, line 53 – col. 3, line 38) such as the applications of APA.

As to claim 20, it is covered by claim 19, except for a service class user and a service class provider connected via a local area network, and the tiered application being distributed between said service class user and said service class provider. APA further teaches a service class user (SCU) and a service class provider (SCP) connected via a local area network (network 13), and the tiered application being distributed (distributed) between said service class user and said service class provider (U S Pat. 5,668,998, col. 3, lines 23-34, 57-63).

As to claim 1, APA teaches a computer system having a tiered application (tiered application) comprising

- a business layer (business tier, [0006]) and an object-oriented (it is noted that DICOM is object-oriented) data management layer (data management tier, [0006]) that communicate via an application programming interface (API, [0014], which is further described by U S Pat. 5,668,998), and

- a database containing DICOM data (DICOM service from a database, [0011]) that is managed by said data management layer (data access layer of data management tier, [0006]), wherein code in said data management layer employs asynchronous messaging (asynchronous message) to accomplish DICOM callback (callback) ([0015]).

APA further teaches implementation (API framework/toolkit) of a business layer comprises code for requesting DICOM service via a message (API on SCU side, fig. 2), and implementation (API framework/toolkit) of the data management layer comprises code for providing DICOM service in response to the request (API on SCP side). See U S Pat. 5,668,998, col. 7, line 40 – col. 8, line 44; col. 13, lines 14-48.

While APA teaches modifications to the tiered application (APA, [0005]; U S Pat. 5,668,998, col. 3, lines 61-65), APA does not teach the modifications include such that the message sent by the first tier is a synchronous message.

Shari teaches modification (emulation) to a tiered application (fig. 4), including configuring an asynchronous system to emulate a synchronous communication, wherein a first tier (application module) sends a synchronous message (synchronous message 432) conforming to the corresponding API (synchronous interface) which simulate a synchronous communication while performing an asynchronous transaction. See col. 6, lines 50-54; col. 9, line 11 – col. 11, line 30; fig. 4. Therefore, it would have been obvious to include a synchronous communication and the emulation thereof into the first tier of APA. One of ordinary skill in the art would have been motivated to perform such a modification because this would have reduced the complexity, and thus the cost, associated with developing applications having asynchronous communications (col. 2, line 53 – col. 3, line 38) such as the applications of APA.

As to claim 2, APA teaches distributed configuration (distributed, U S Pat. 5,668,998, fig. 2).

As to claim 3, APA teaches said database is based on a directory of DICOM files (DICOM service from a database/archive [0011]).

As to claim 4, teaches said data management layer implementation comprises an initialization method for constructing, at runtime, underlying objects of said data management layer implementation (map service objects, derive subclasses to customize toolkit, U S Pat. 5,668,998, col. 2, line 57 – col. 3, line 4). It is noted that providing different invocation interfaces / service objects for different types of underlying databases is well known.

As to claims 5, 6, 7, APA teaches ([0011]) said database comprises DICOM files (DICOM service from a database/archive), archive (database/archive), network object (network object).

As to claim 14, APA as modified teaches said implementation of said data management layer comprises code for sending asynchronous messages (APA, asynchronous message, [0015]) requesting DICOM service and said request is in the

Art Unit: 2126

format of a synchronous message (Shari, synchronous message sent from the first tier). See discussion of claim 19 for detail.

10. Claims 8, 9, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over author admitted prior art APA including Mason et al in view of Shari as applied to claim 1 and further in view of Atsatt (U S Pat. 6,182,107).

As to claim 8, APA teaches that the implementation of said data management layer manages life time of objects (col. 9, lines 6-18), but does not teach this if performed by a class/objects having a method for counting the number of references to each object.

Atsatt teaches managing life time of objects (manage life time), including using objects of a class (counter wrapper class) having a method for counting the number of references to each object (count the number of objects referencing target object). See col. 3, lines 10-37. Therefore, it would have been obvious to include class/objects having a method for counting the number of references to each object into the data management layer of APA as modified. One of ordinary skill in the art would have been motivated to do so because this would have automatically cleared objects from memory after they are no longer used (col. 2, lines 37-44), necessary for a large and long running distributed system such as APA as modified.

As to claim 9, caching/copying reference counts is well known. For example, in a distributed object management environment, reference counts are typically recorded both at a local object manager and at a central/remote object manager.

As to claim 11, APA as modified teaches removing children/object that have no references (Atsatt, initiate destruction when references diminishes to zero, col. 3, lines 10-37).

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over author admitted prior art APA including Mason et al in view of Shari and Atsatt as applied to claim 9 and further in view of Bernstein et al (U S Pat. 5,884,16).

As to claim 10, Bernstein teaches implementation of data management, wherein each object of a session class (session object 530) has a method for caching the corresponding object state (object state cache 550). Col. 6, lines 6 – col. 7, line 4. Therefore, it would have been obvious to include session class/objects into APA as modified. One of ordinary skill in the art would have been motivated to do so because this would have avoided explicit passing of session parameters in each service invocation (coll. 7, lines 8-20), desirable in the multi-user/context environment such as the DICOM service application of APA as modified. When the teachings are combined, clearing the cache in response to a message from the business/first layer, such as a complete/abort message, would have been obvious in view of the object life time / memory management as taught by Atsatt.

12. Claims 15, 16, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over author admitted prior art APA including Mason et al as applied to claim 13 and further in view of Atsatt.

As to claims 15, 16, 18, note claims 8, 9, 11, respectively, for discussions.

13. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over author admitted prior art APA including Mason et al in view of Atsatt as applied to claim 16 and further in view of Bernstein et al.

As to claim 16, note discussion of claim 10. An input to an operator interface would have been an obvious source of messaging.


14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sue Lao whose telephone number is (703) 305-9657. A voice mail service is also available at this number. The examiner's supervisor, SPE Meng-Ai An, can be reached on (703) 305 9678. The examiner can normally be

Art Unit: 2126

reached on Monday - Friday, from 9AM to 5PM. The fax phone number for the organization where this application or proceeding is assigned is (703) 872 9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-9600.

Sue Lao 

May 27, 2004